BE IT KNOWN, that **John C. Steven, III, Gad Shaanan, Walter Francovich, Francois Duval, Patrick Mainville** and **Benoit Orban** have invented a new and useful improvement in:

BELT CLIP ATTACHMENT DEVICE AND METHOD OF USE

PROCOPIO, CORY, HARGREAVES & SAVITCH, LLP
530 B Street, Suite 2100
San Diego, California 92121

Express Mail Label No. EV 324 274 078 US
Date of Deposit; August 22, 2003

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Mail Stop PATENT APPLICATION, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

Karen M. Cruz

August 21, 2003
Date

BELT CLIP ATTACHMENT DEVICE AND METHOD OF USE

FIELD OF THE INVENTION

[01] The present invention is in the field of belt clip attachment devices for attaching personal electronic devices such as wireless mobile phones to belt clips.

BACKGROUND OF THE INVENTION

[02] Belt clips and belt clip attachment devices have been proposed in the past for connecting a mobile phone to the belt of a user. These belt clips and attachment devices have suffered from a number drawbacks, some of which include: the belt clips are too large and bulk, making them uncomfortable and obtrusive; use of the mobile phone with the belt clip often requires extra material on the sides of the mobile phone to attach the mobile phone to the belt clip (this is fine when the mobile phone is attached to the belt clip, but when the mobile phone is being used, the extra material makes the mobile phone bulky); often the belt clip is specific for a particular type of mobile phone, making the belt clip inoperable with other mobile phones; some belt clip attachment devices are difficult to install and/or difficult to remove from the mobile phone; the design of some belt clips and belt clip attachment devices inadvertently allows the mobile phone to pop off of the belt clip.

SUMMARY OF THE INVENTION

[03] The above drawbacks and others are addressed by the belt clip and belt clip attachment device of the present invention.

[04] An aspect of the invention involves a belt clip attachment device that attaches to an existing battery door latch on the rear side of a mobile phone. The belt clip

attachment device includes a unique design that allows it to attach and lock to the battery door latch with a unique pushing and rotating motion. The belt clip attachment device and a corresponding belt clip may have cooperative configurations that allow the belt clip attachment device and mobile phone to be connected to the belt clip at numerous possible orientations with respect to the user's belt. The belt clip attachment device may also be connected to a wide variety of generic belt clips currently on the market. The belt clip attachment device is universal in that it may be used with a variety of different mobile phones that are configured for attachment thereto.

[05] Further objects and advantages will be apparent to those skilled in the art after a review of the drawings and the detailed description of the preferred embodiments set forth below.

BRIEF DESCRIPTION OF THE DRAWINGS

[06] FIG. 1A is a perspective view of a mobile phone and a belt clip attachment device constructed in accordance with an embodiment of the invention.

[07] FIG. 1B is a front elevational view of a battery compartment door and a door latch.

[08] FIG.1C is a side elevational view of the battery compartment door and the door latch of FIG. 1 B.

[09] FIG. 1D is a perspective view of the belt clip attachment device illustrated in FIG. 1A.

[10] FIGS. 1E-1G illustrate a cross-sectional view of the belt clip attachment device and a rear portion of the mobile phone illustrated in FIG. 1A, and show an exemplary

method of attaching the belt clip attachment device to the door latch of the battery compartment door.

[11] FIGS. 1H-1K illustrate a front elevational view, a side elevational view, a rear elevational view , and a perspective view of an embodiment of a belt clip that may be used with the belt clip attachment device shown in FIG. 1A.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[12] With reference to FIGS. 1A-1K, an embodiment of a universal belt clip attachment device or knob 100 used to connect a mobile phone 110 to a belt clip 120 will now be described. Although the universal belt clip attachment device 100 will be described as being used to connect a mobile phone 110 to a belt clip 120, the universal belt clip attachment device 100 may be used to connect other personal electronic devices to the belt clip 120. Before describing the belt clip attachment device 100, the mobile phone 110 will first be described.

[13] The mobile phone 110 includes a housing 130 with a rear side 140 and a substantially elliptical battery compartment door 150 detachably locked to the rear side 140 through a battery compartment door latch 160. The battery compartment door 150 includes a top curved edge 170 and a bottom curved edge 172. Adjacent the bottom curved edge 172, the battery compartment door 150 may include a tang (not shown) for use in attaching the battery compartment door 150 to the housing 130. The top curved edge 170 may include a semi-circular cut out 180 near the center of the top curved edge 170.

[14] As shown best in FIGS. 1C, 1D, a substantially C-shaped latch arm 190 extends from the top curved edge 170 at the semi-circular cut out 180. A tang 200 extends laterally from the latch arm 190 and is used to retain the battery compartment door latch 160 to the housing 130. The latch arm 190 terminates in a circular, disc-shaped latch actuator 210. When the battery compartment door 150 is in position in the rear side 140 of the housing 130, a circular recess 220 is formed around the latch actuator 210. In an alternative embodiment, the latch 160 may be connected to the housing 130 instead of the battery compartment door 150. Two pegs 222 extend laterally from the housing 130 and are received by the belt clip attachment device 100 in a manner to be described. Alternatively, the two pegs 222 may extend from the battery compartment door 150 such as from the latch arm 190. Further, in alternative embodiments the number of pegs 222 may be other than 2 (e.g., 1, 3, etc.). The battery compartment door 150 may be a thin member as shown, or may be part of a thicker member such as part of a rechargeable battery, fuel cell, or other renewable power source.

[15] With reference to FIG. 1D, the belt clip attachment device, adapter, or knob 100 will now be described in more detail. The belt clip attachment device 100 includes a belt clip engagement member 240 having a starburst configuration. In alternative embodiments, the belt clip engagement member 240 may have configurations other than a starburst configuration. For example, but not by way of limitation, the belt clip engagement member 240 may have a circular configuration, an elliptical configuration, an oval configuration, a curvilinear configuration, or a rectilinear configuration. The belt clip engagement member 240 includes a central circular well 242 and a plurality of outwardly curved radiating projections 244 joined by respective inwardly curved

connection portions 246. An upper cylindrical member 248 joins the belt clip engagement member 240 to a lower cylindrical hub 250.

[16] Opposite C-shaped slots 260 are located in the lower cylindrical hub 250. Although two slots 260 are described, other numbers of slots 260 may be used (e.g., 1, 3, 4, etc.). Each slot 260 may include an insertion/removal tack 262, a rotation track 264, and a locking track 266. A stop or post 268 may separate the insertion/removal track 262 from the locking track 266. A resilient member 270 (See FIGS. 1E-1G) may be located within the upper cylindrical member 248 and the lower cylindrical hub 250. Exemplary resilient members that may be used for the resilient member 270 include, but not by way of limitation, an elastic rubber disc and a spring.

[17] With reference to FIGS. 1E-1G, attachment of the belt clip attachment device 100 to the mobile phone 110 will now be described. As shown in FIG. 1E, the belt clip attachment device 100 is attached to the mobile phone 110 by aligning the insertion/removal track 262 of the belt clip attachment device 100 with the lateral pegs 222 (FIG. 1A), and pressing and inserting the open circular end of the lower cylindrical hub 250 over the circular latch actuator 210 so that the lateral pegs 222 are slidably received into the insertion/removal track 262. The resilient member 270 urges the belt clip attachment device 100 in the opposite direction, so an opposite pushing pressure is required to overcome the pressure exerted by the resilient member 270. As shown in FIG. 1F, the belt clip attachment device 100 is then rotated or twisted while maintaining this pushing force so that the lateral pegs 222 are slidably received in the rotation track 264 past the stop 268. As shown in FIG. 1G, the belt clip attachment device 100 is then released so that the resilient member 270 urges the belt clip attachment device 100

outward and the lateral pegs 222 are slidably received in the locking track 266 until the lateral pegs 222 abut the stop 268. In the position shown in FIG. 1G, the belt clip attachment device 100 is locked in place.

[18] To unlock the belt clip attachment device 100 from the mobile phone 110, the belt clip attachment device 100 is pressed towards the mobile phone 110, rotated in a direction opposite to that shown in FIG. 1F, and then released and removed from the circular latch actuator 210.

[19] Although the belt clip attachment device 100 is described as being attached to the battery compartment door latch 160, in alternative embodiments, the mobile phone 110 may have an alternative configuration where the belt clip attachment device 100 attaches to the rear side 140 of the mobile phone 110 at an alternative location.

[20] With reference to FIGS. 1H-1K, an embodiment of a belt clip 120 that the universal belt clip attachment device 100 may be used with will now be described. The belt clip 120 includes a belt attachment section 300 and an opposite-facing phone attachment section 310.

[21] The belt attachment section 300 includes a back plate 320 and a clip 330 pivotally attached to the back plate 320 by a pivot mechanism 340. The pivot mechanism 340 preferably includes a spring (not shown) to urge the clip 330 in the position shown in FIGS. 1H-1K. An upper part of the clip 330 includes a pivot control member 350 and a lower part of the clip 330 includes a closed end 360. A belt-receiving recess 370 is formed between the clip 330, the back plate 320, the pivot mechanism 340 and the closed end 360.

[22] The phone attachment section 310 includes an elongated narrow frame 380. A rear portion 390 of the frame 380 slidably receives an actuation member or plunger 400. The actuation member 400 includes side flanges that are slidably received by a track of the rear portion 390 of the frame 380. An upper part of the actuation member 400 includes a broad thumb-engagement portion 410. A lower part of the actuation member 400 include a hole that slidably receives a movable locking tang 420. The movable locking tang 420 and the actuation member 400 preferably include respective springs (not shown) to urge the tang 420 and the actuation member 400 in the positions shown in FIG. 1K. Adjacent a bottom of the actuation member 400, the actuation member 400 includes one or more stops (not shown) that cooperate with the projections 244 and connection portions 246 of the belt clip engagement surface 240 to maintain the belt clip attachment device 100 (and the mobile phone 110) in a desired orientation.

[23] A front portion 430 of the frame 380 has a substantially C-shaped configuration with an elongated central recess 440 for slidably receiving the cylindrical hub 250 of the belt clip attachment device 100 and opposite tracks 450 for slidably receiving the belt clip engagement member 240 of the belt clip attachment device 100.

[24] When the belt clip attachment device 100 (with attached mobile phone 110) is slid to the position shown in FIGS. 1H, 1I, the belt clip engagement member 240 contacts and urges the movable locking tang 420 rearward. Once the belt clip engagement member 240 clears the movable locking tang 420, the movable locking tang 420 is urged by its spring to the position shown in FIG. 1K so that the movable locking tang 420 is disposed within the well 242 of the belt clip attachment device 100. The tang 420 within the well 242, in addition to the one or more stops of the actuation

member 400 engaged with the projections 244 and connection portions 246 of the belt clip engagement surface 240, lock the belt clip attachment device 100 (and mobile phone 110) in the position shown in FIGS. 1H, 1I, or other desired orientation relative to the user's belt that the user selects.

[25] In the embodiment of the belt clip attachment device 100 shown, the belt clip attachment device 100 includes eight projections 244, connection portions 246, allowing the belt clip attachment device 100 (and mobile phone 110) to be oriented in eight different positions relative to the users belt in 45 degree increments (i.e., 0, 45, 90, 135, 180, 225, 270, or 315 degrees relative to the user's belt). In alternative embodiments, the number of projections 244, connection portions 246 may be a number other than eight (e.g., 0, 1, 2, 3, etc.).

[26] To remove the belt clip attachment device 100 (and mobile phone 110) from the belt clip 120, the broad thumb-engagement portion 410 is pressed with the user's thumb, causing the actuation member 400 to disengage the movable locking tang 420. The belt clip attachment device 100 may then be slid freely upward and out of the elongated central recess 440 and tracks 450 of the belt clip 120.

[27] In a similar fashion, a user may change the orientation of the belt clip attachment device 100 (and mobile phone 110) relative to a user's belt. After disengaging the movable locking tang 420, the belt clip attachment device 100 (and mobile phone 110) may be slid upward and rotated to the desired orientation relative to the user's belt, and slid downward to the position shown in FIG. 1H where the belt clip attachment device 100 (and mobile phone 110) are locked in the desired orientation.

[28] The push, twist, and lock feature of the universal belt clip attachment device 100 provides an easy, convenient way to attach and secure the universal belt clip attachment device 100 to the mobile phone 100. The universal belt clip attachment device 100 may be used with a variety of different mobile phones 110 as long as the mobile phones 110 are configured for attachment thereto with the universal belt clip attachment device 100. As a result, the belt clip 120 may be used with a variety of different mobile phones 110. Further, the universal belt clip attachment device 100 and belt clip 120 allow the user to easily orient one's mobile phone 110 in a variety of different orientations relative to the user's belt in addition to the standard orientation provided by existing belt clips and adapters (i.e., perpendicular and upright relative the user's belt or parallel to a user's belt). The belt clip attachment device 100 may also be connected to a wide variety of generic belt clips currently on the market.

[29] It will be readily apparent to those skilled in the art that still further changes and modifications in the actual concepts described herein can readily be made without departing from the spirit and scope of the invention as defined by the following claims.